AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) A communication method ~~for deploying forward error correction (FEC) in transmission networks~~, comprising the steps of:

FEC encoding a signal in a first domain, the signal being a first domain signal;

~~inverse multiplexing~~ demultiplexing the FEC encoded first domain signal into N segments in the first domain;

inserting data into each of the N segments, the data indicating a start location associated with said each of the N segments;

converting the N segments in the first domain into N segments in a second domain; and

combining the second domain N segments into a combined signal in the second domain for transport on a transmission medium,

wherein the first domain is an electrical domain and the second domain is an optical domain.

2. (Original) The method of claim 1 wherein the first domain signal is at a first baud rate and the first and second domain signal N segments are at second baud rate.

3. (Original) The method of claim 2 wherein the first baud rate is higher than the second baud rate.

4. (Original) The method of claim 2 wherein the second baud rate is higher than the first baud rate.

5. (Original) The method of claim 2 wherein the first and second baud rates are the same.

6. (Cancelled)

7. (Original) The method of claim 1 wherein the where the step of converting comprises a monolithic photonic integrated circuit (PIC) having integrated N signal channels for converting a respective signal segment in the first domain into a signal segment in the

second domain and multiplexing the N channel signal segments to form the combined signal.

Claims 8-22 (Cancelled)

23. (Currently Amended) A method for deploying forward error correction (FEC) in transmission networks, comprising the steps of:

FEC encoding a first multiplexed signal comprising M signals in a first domain at a first baud rate;

~~inverse multiplexing~~ demultiplexing the encoded multiplexed signal of the first domain into N signals in the first domain at a second baud rate, each of the N signals carrying a plurality of segments;

inserting data into each of the plurality of segments, the data indicating a start location of said each of the plurality of segments;

converting the first domain N signals into N signals in a second domain; and

combining the second domain N signals at the second baud rate into a combined signal for transport on a transmission medium,

wherein the first domain is an electrical domain and the second domain is an optical domain.

24. (Original) The method of claim 23 wherein the first baud rate is higher than the second baud rate.

25. (Original) The method of claim 23 wherein the second baud rate is higher than the first baud rate.

26. (Original) The method of claim 23 wherein the first and second baud rates are the same.

27. (Cancelled)

28. (Original) The method of claim 23 wherein the where the step of converting comprises a monolithic photonic integrated circuit (PIC) having integrated N signal channels for converting a respective N signal in the first domain into a N signal in the second domain and multiplexing the N channel signals to form the combined signal.

Claims 29-33 (Cancelled)

34. (Currently Amended) A method for deploying forward error correction (FEC) in transmission networks, comprising the steps of:

decombining [[a]] an FEC encoded combined signal in a ~~second~~ first domain and received from a transmission medium into N segments in the ~~second~~ first domain;

converting the N segments in the ~~second~~ first domain into N segments in ~~the first~~ a second domain;

detecting a start location of each of the N segments based on data included in the N segments;

multiplexing the ~~first~~ second domain N segments into a multiplexed M signal comprising M signals in the ~~first~~ second domain; and

FEC decoding the first domain multiplexed M signal,

wherein the first domain is an optical domain and the second domain is an electrical domain.

35. (Cancelled)

36. (Currently Amendedl) The method of claim 34 wherein the first domain signal is at a first baud rate and each of the ~~first and~~ second domain signal N segments are at a second baud rate.

37. (Original) The method of claim 36 wherein the first baud rate is higher than the second baud rate.

38. (Original) The method of claim 36 wherein the second baud rate is higher than the first baud rate.

39. (Original) The method of claim 36 wherein the first and second baud rates are the same.

40. (Cancelled)

41. (Currently Amended) The method of claim 34 wherein the where the step of converting comprises a monolithic photonic integrated circuit (PIC) having integrated N signal channels [[for]] converting a respective signal segments in the first domain into

signal segment a in the second domain and multiplexing the N channel signal segments to form the combined signal.

Claims 42-57 (Cancelled)

58. (Currently Amended) A method for deploying forward error correction (FEC) in transmission networks, comprising the steps of:

providing [[a]] an FEC encoded combined signal comprising a plurality of M signals combined in a ~~second~~ first domain at a second baud rate;

decombining the FEC encoded combined signal of M signals in the ~~second~~ first domain into N signals in the ~~second~~ first domain;

converting the N signals in the second domain into N signals in a ~~first~~ second domain, each of the N signals including a plurality of segments;

inserting data into each of the plurality of segments, the data indicating a start location of said each of the plurality of segments;

multiplexing the ~~first~~ second domain N signals into a ~~first~~ second domain multiplexed M signal of M signals at a second baud rate; and

FEC decoding the ~~first~~ second domain multiplexed M signal,

wherein the first domain is an optical domain and the second domain is an electrical domain.

59. (Currently Amended) The method of claim 58, wherein the plurality of M signals is a first plurality of M signals, the method further comprising the ~~further~~ step of demultiplexing the FEC decoded multiplexed M signal into a second plurality of M signals ~~in the first domain~~ and forwarding each of the plurality of M signals to ~~respective~~ a corresponding one of data sinks.

60. (Original) The method of claim 58 wherein the first baud rate is higher than the second baud rate.

61. (Original) The method of claim 58 wherein the second baud rate is higher than the first baud rate.

62. (Original) The method of claim 58 wherein the first and second baud rates are the same.

63. (Cancelled)

64. (Currently Amended) The method of claim 58 wherein the where the step of converting comprises a monolithic photonic integrated circuit (PIC) having integrated N signal channels [[for]] converting a respective N signal in the ~~first~~ second domain into [[a]] an N signal in the ~~second~~ first domain and multiplexing the N channel signals to form the combined signal.

Claims 65-69 (Cancelled)

70. (Currently Amended) A transmission network having a transmitter side and a receiver side, comprising:

said transmitter side comprising:

a plurality data ~~source~~ sources for providing a multiplexed M signal [[of]] including M signals in a first domain and modulated at a first baud rate;

[[a]] an FEC encoder for encoding the multiplexed M signal;

~~an inverse multiplexer~~ a demultiplexer circuit ~~for converting~~ that converts the encoded multiplexed M signal into N signal segments, each of the N signal segments being at a second baud rate in the first domain and including data, the data indicating a start location of said each of the N signal segments;

a first converter for converting the N signal segments in the first domain into N signal segments of a second domain; and

a combiner for combining the N signal segments of a second domain into a combined signal in the second domain for transport on a transmission medium;

said receiver side comprising:

a decombiner for receiving said combined signal in the second domain from the transmission medium and decombing said combined signal into N segments in the second domain

a second converter for converting the N segments in the second domain into N segments in the first domain;

a multiplexer for converting the first domain N segments at a first baud rate into a multiplexed M signal at a second baud rate comprising said first domain M signals each at the first baud rate; and

[[a]] an FEC decoder for decoding the multiplexed M signal,

wherein the first domain is an electrical domain and the second domain is an optical domain.

Claims 71 -76 (Cancelled)

77. (Currently Amended) The transmission network of claim 70 wherein said first converter on said transmitter side comprises a monolithic photonic integrated circuit (PIC) having N signal channels for converting a respective N signal segment in the first domain into a respective N signal segment in the second domain and multiplexing the N channel signal segments to form the combined signal.

78. (Original) The transmission network of claim 77 wherein said first domain comprises an electrical domain and said second domain comprises an optical domain; said monolithic photonic integrated circuit (PIC) comprises an array of N laser sources, an array of N optic-electric modulators and an optical combiner to combine N optical signal segments into said combined signal for transport on said transmission medium; said transmission medium comprising an optical fiber.

79. (Original) The transmission network of claim 78 wherein said laser sources comprise an array of DFB lasers or DBR lasers.

80. (Original) The transmission network of claim 78 wherein said electro-optic modulators comprise an array of electro-absorption modulators or Mach-Zehnder modulators.

81. (Original) The transmission network of claim 78 wherein said optical combiner comprises an arrayed waveguide grating (AWG) or an Echelle grating.

82. (Currently Amended) The transmission network of claim 70 wherein said second converter on said receiver side comprises a monolithic photonic integrated

circuit (PIC) comprising a demultiplexer for decombining the combined signal into N signal segments and converting a respective N signal segment in the second domain into a respective N signal segment in the first domain.

83. (Original) The transmission network of claim 82 wherein said first domain comprises an electrical domain and said second domain comprises an optical domain; said monolithic photonic integrated circuit (PIC) comprises an optical decombiner for decombing said combined signal into N optical signal segments and an array of photodetectors for each converting a respective optical signal segment into a respective electrical signal segment.

84. (Original) The transmission network of claim 82 wherein said decombiner comprises an arrayed waveguide grating (AWG) or an Echelle grating.

85. (Original) The transmission network of claim 82 wherein said array of photodetectors comprise an array of PIN photodiodes or an array of avalanche photodiodes.

Claims 86-111 (Cancelled)